SERVICE MANUAL

TX-5300

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TX-5300

SEMICONDUCTOR Diodes 6 **FM SECTION** Circuitry 1 FET, 1-stage RF Amplifier, 3-gang Variable Capacitor, 5-stage Limiter, PLL MPX Circuit Sensitivity Signal-to-Noise Ratio 70dB (mono), 68dB (stereo) Total Harmonic Distortion 100Hz 0.2% (mono) 0.4% (stereo) 1kHz 0.2% (mono), 0.4% (stereo) 10kHz 0.2% (mono), 0.6% (stereo) Capture Ratio 1.0dB Frequency Response 50Hz \sim 10kHz $^{+0.2}_{-0.5}$ dB $20Hz \sim 15kHz + 0.2 dB$ Separation 1kHz35dB 50Hz ~ 10kHz 30dB Image Rejection 60dB AM Suppression 50dB Sub Carrier Suppression.....40dB Muting Threshold 2.2 μ V Circuitry 1-stage RF Amplifier, 2-gang Variable Capacitor Sensitivity (IHF, Ferrite antenna) . . $300\mu V/m$ (IHF, Ext. antenna) 15μ V Signal-to-Noise Ratio 50dB Image Rejection 40dB **AUDIO SECTION** Output level/Impedance

1. SPECIFICATIONS

MISCELLANEOUS	
Power Requirements AC 110V, 120V, 130V	/, 220V, and
240V 50Hz/60Hz	
Power Consumption 12W	
Dimensions	3(D) mm
13-3/4 x 4-15/16 x 11	-15/16 in
Weight Without Package 4.8kg (10 lb 9 oz)	
With Package 5.9kg (13 lb)	
FURNISHED PARTS	
FM T-type Antenna1	
Connection Cord with Pin Plugs 1	k.ar.
Operating Instructions 1	
Fuse 0.5A 1	
Fuse 1A1	
Womp.	
NOTE.	

NOTE:

Specifications and the design subject to possible modification without notice due to improvements.

2. FRONT PANEL FACILITIES

rFUNCTION SWITCH

Switch for selecting type of broadcast reception.

FM AUTO:

To receive AM broadcasts

(MUTING ON)

To receive FM stereo broadcasts. When an FM monophonic signal is being received,

tuner automatically switches to monophonic operation. FM STEREO indicator

lights during stereo reception.

FM MONO: (MUTING OFF)

To receive FM monophonic broadcasts. Recommended also when FM AUTO re-

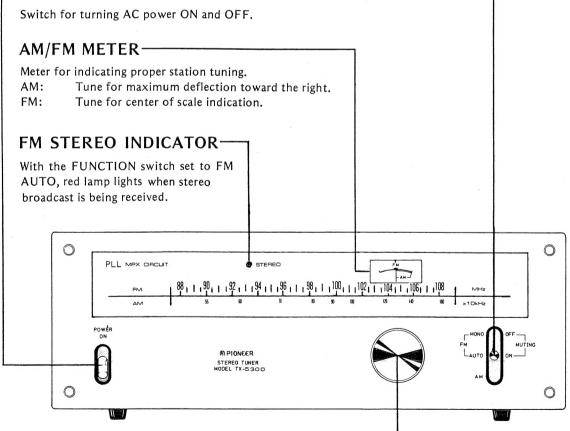
ception is noisy and when receiving ex-

tremely weak stations.

NOTE

In the FM MUTING ON position, inter-station noise is suppressed when tuning FM stations.

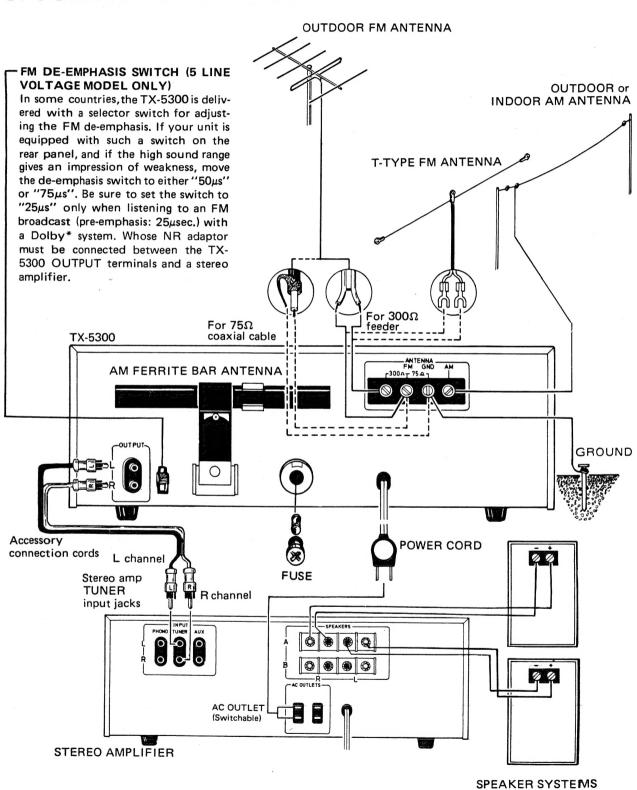
POWER SWITCH



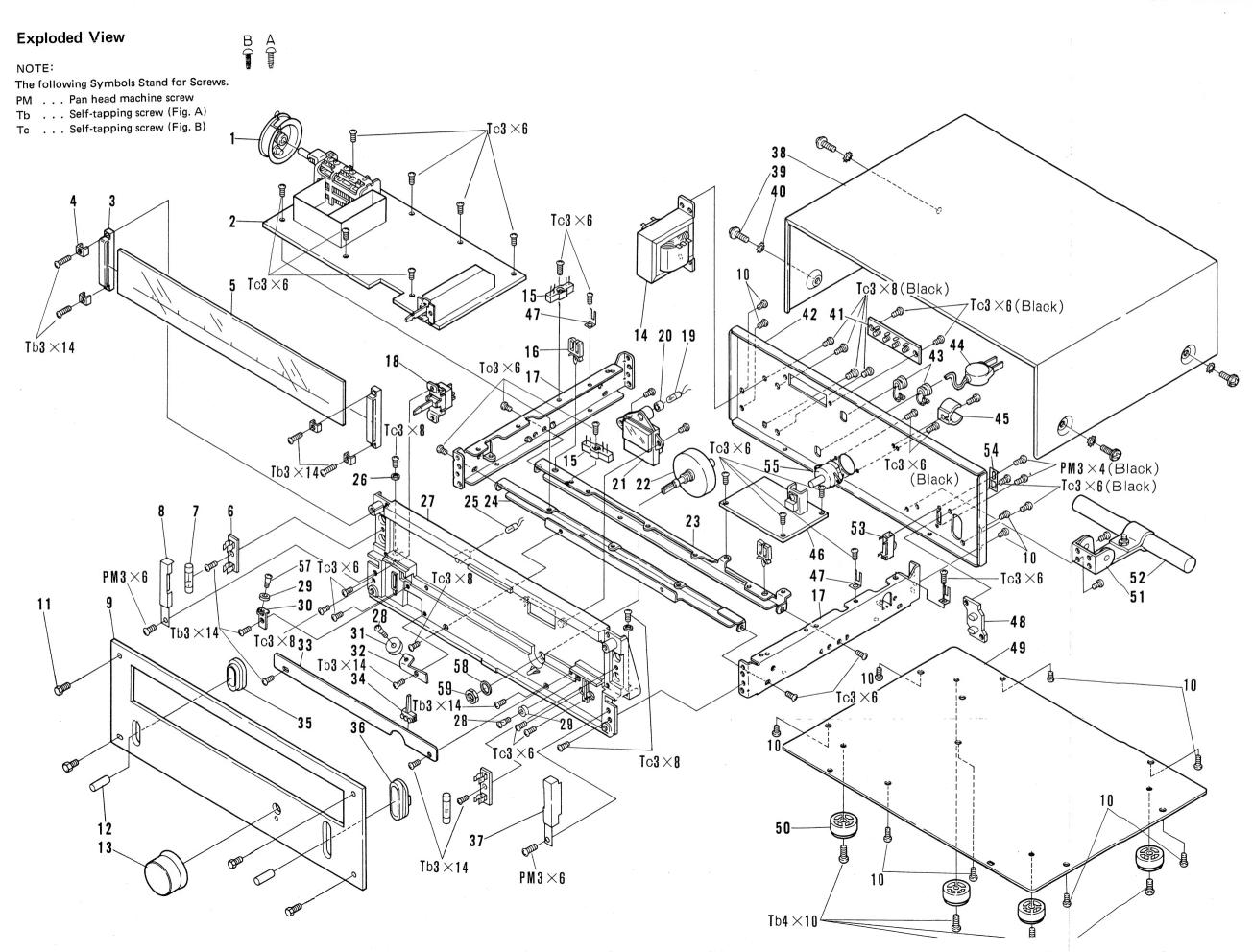
Employ for selecting stations. Observe AM/FM meter when tuning.

TUNING KNOB

3. CONNECTION DIAGRAM

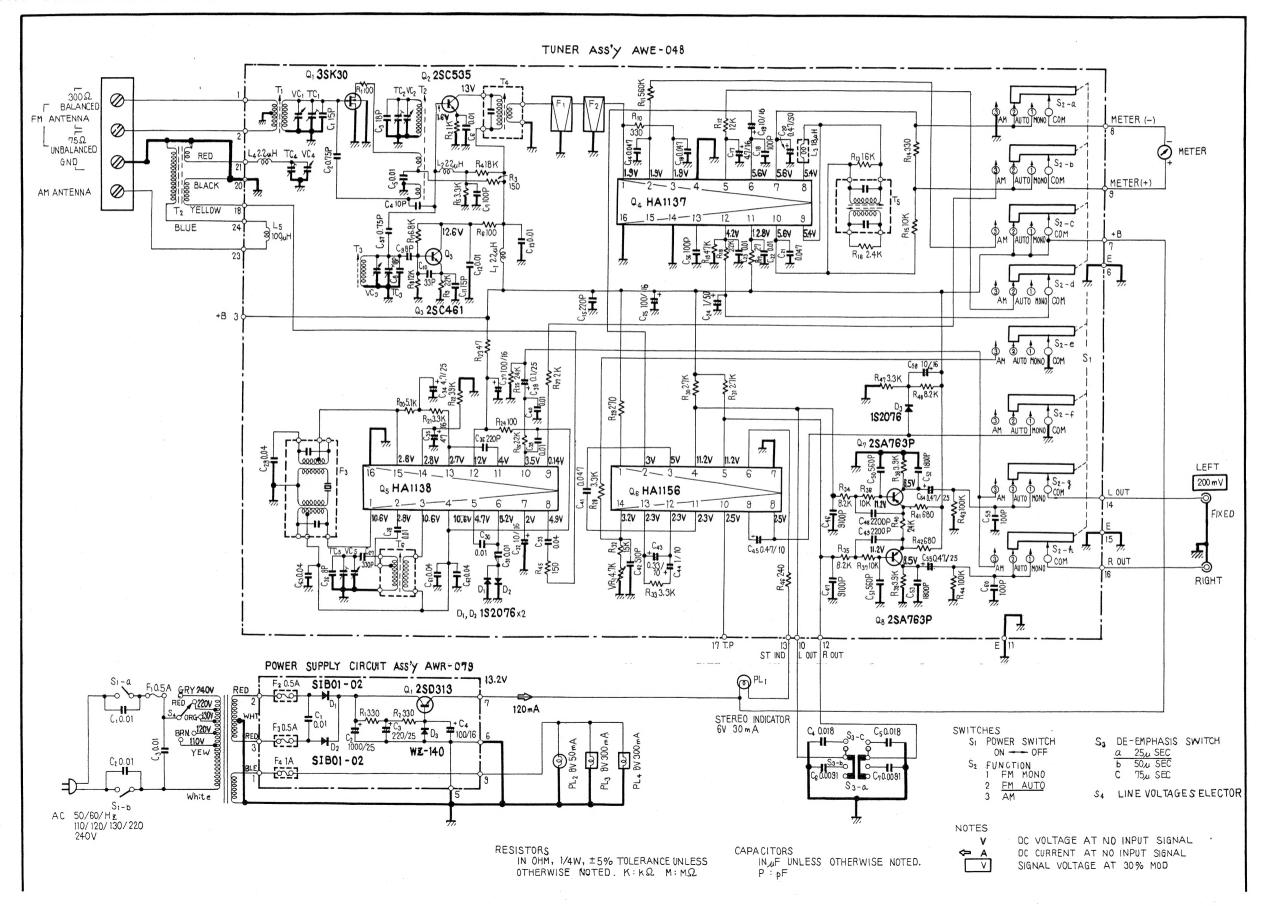


^{*} The word "Dolby" is a trademark of Dolby Laboratories Inc.

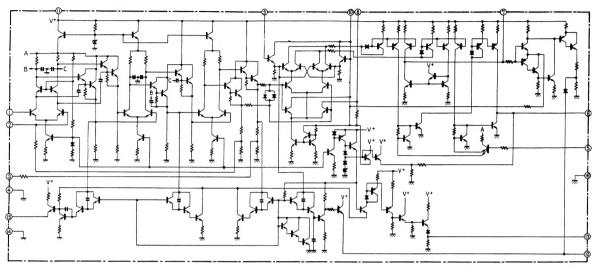


11. SCHEMATIC DIAGRAMS, P.C.BOARD PATTERNS AND PARTS LIST

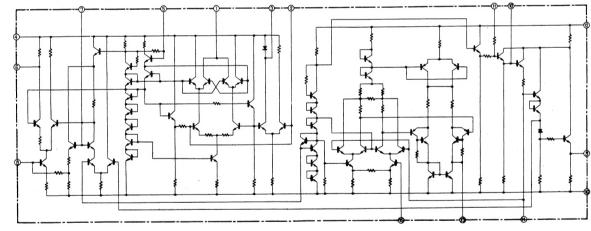
11.1 SCHEMATIC DIAGRAM



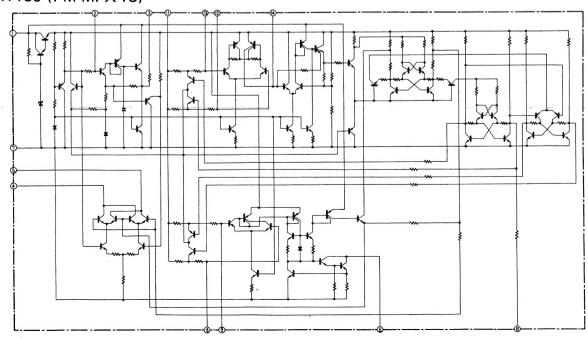
HA1137 (FM IF IC)



HA1138 (AM IC)



HA1156 (FM MPX IC)



11.2 ELECTRO-PARTS LIST

- CAPACITORS: IN μ F UNLESS OTHERWISE NOTED p:pF RESISTORS: IN Ω , 1/4W UNLESS OTHERWISE NOTED k:k Ω , M:M Ω

CAPACITORS

Symbol	Description		Description Part No.		
C1	Ceramic	0.01	250V	ACG-001-0	
C2	Ceramic	0.01	250V	ACG-001-0	
C3	Ceramic	0.01	250V	ACG-001-0	4
C4	Mylar	0.018	50V	CQMA 183J 50	
C5	Mylar	0.018	50V	CQMA 183J 50	
C6	Mylar	0.0091	50V	CQMA 912J 50	
C7	Mylar	0.0091	50V	CQMA 912J 50	

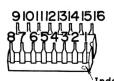
LAMPS, FUSES

Symbol	Description	Part No.	
PL1	Lamp, 6V 30mA (STEREO IND.)	AEL-017-A	with leads
PL2	Lamp, 8V 50mA (AM/FM meter)	AEL-026-0	with leads
PL3	Lamp, 8V 300mA (dial scale)	E22-032-0	bar type
PL4	Lamp, 8V 300mA (dial scale)	E22-032-0	bar type
F1	Fuse 0.5A (primary)	AEK-016-0	,
F2	Fuse 0.5A (secondary)	AEK-016-0	
F3	Fuse 0.5A (secondary)	AEK-016-0	1
F4	Fuse 1A (lamps)	AEK-106-0	

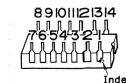
OTHERS

Symbol	Description	Part No.	
S1	Lever switch (POWER)	ASK-024-0	
S3	Slide switch (DE-EMPHASIS)	ASH-013-0	
T1	Power transformer	ATT-218-0	
T2	Ferrite bar antenna	ATB-038-0	

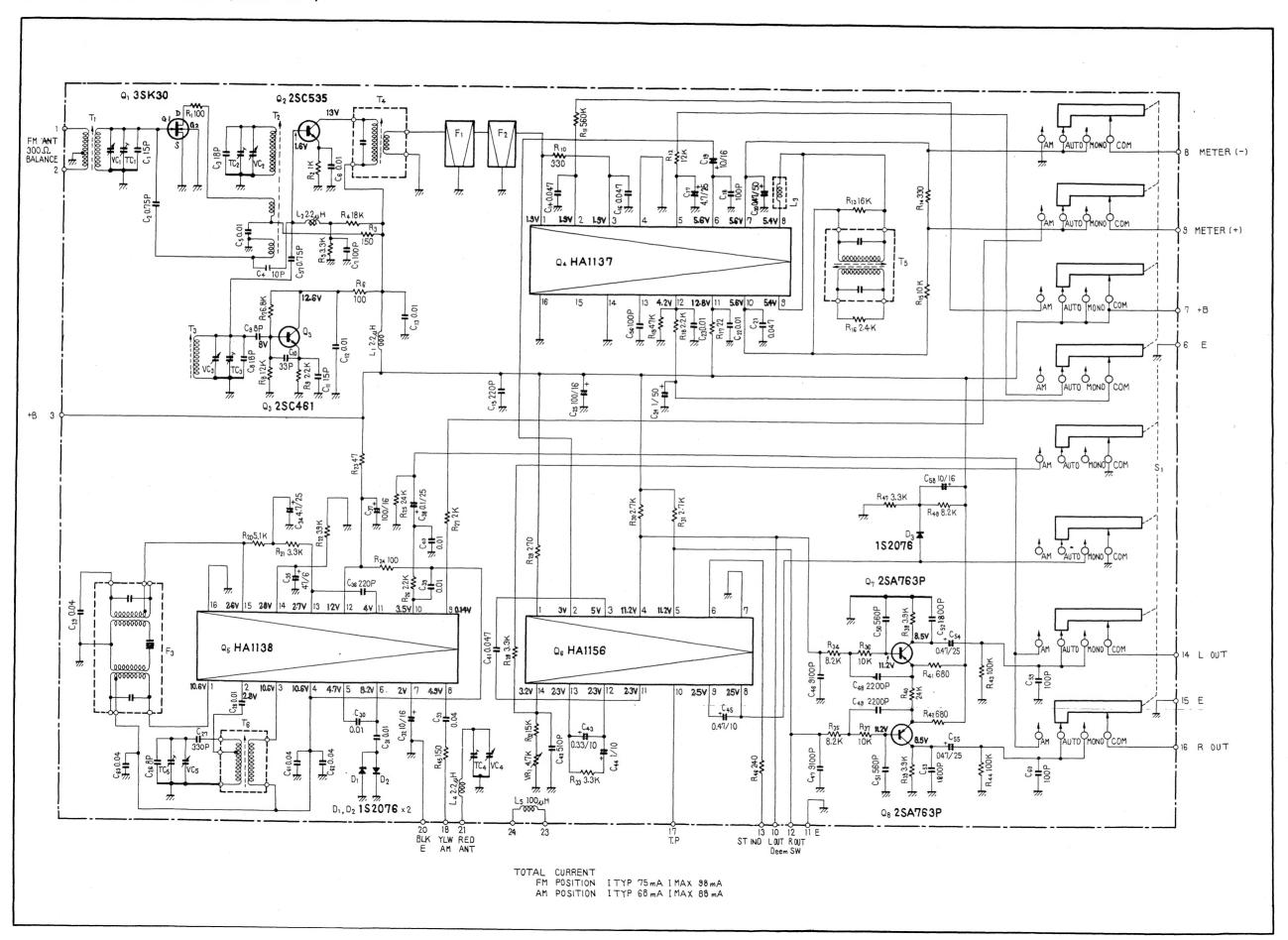
HA1137 HA1138



HA1156



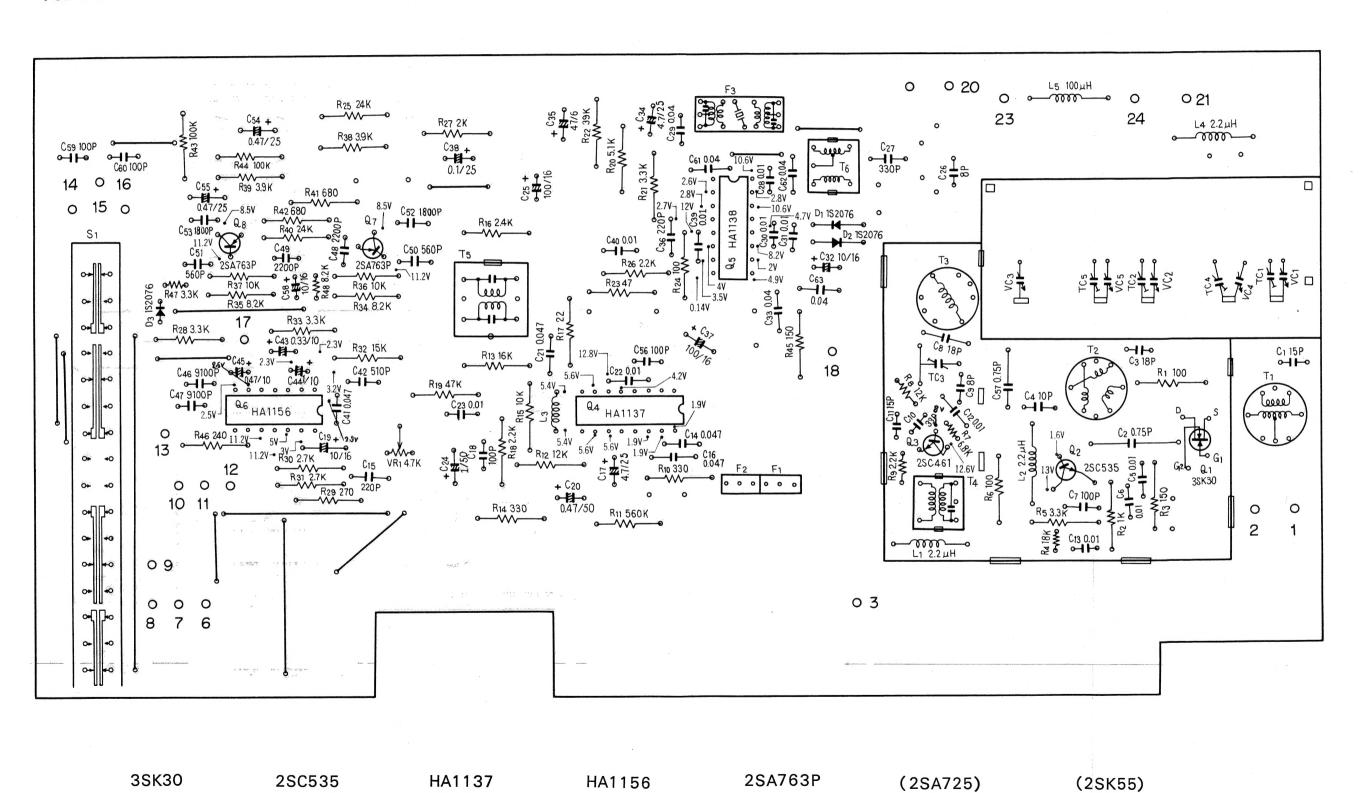
11.3 TUNER ASSEMBLY (AWE-048-0)



Foil Side

2SC461

HA1138



Part List of Tuner Assembly (AWE-048-0)

CAPACITORS

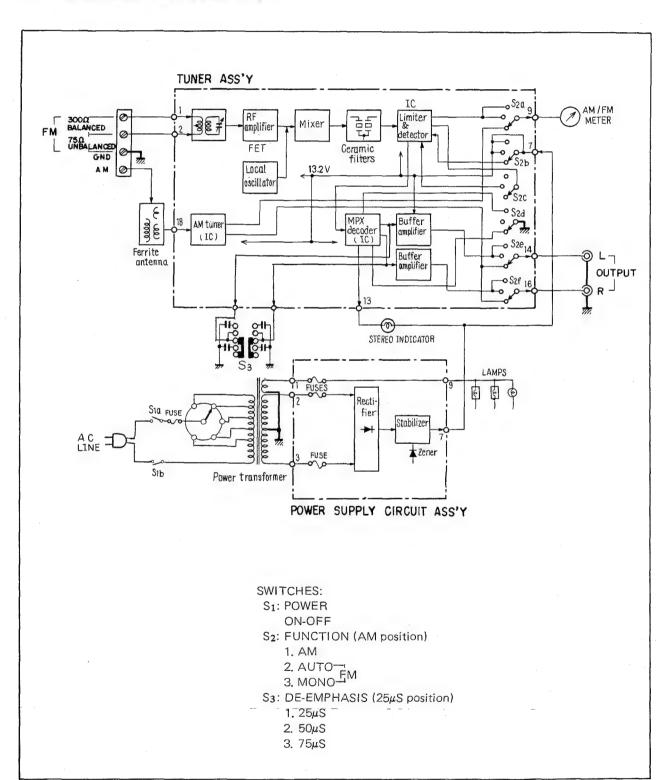
Symbol	De	escription		Part No.	
VC TC3	Tuning capaci Ceramic trimn			ACK-012-0 C43-007-A	
C1	Ceramic	15p	50V	CCDTH 150K 50	
C2	Ceramic	0.75p	500V	CGB R75K 500	
C3	Ceramic	18p	50V	CCDTH 180K 50	
C4	Ceramic	10p	50V	CCDSL 100K 50	
	Ceramic	0.01	50V 50V	CKDYF 103Z 50	
C5	Ceramic	0.01	50 V	CKD1F 1032 50	
C6	Ceramic	0.01	50V	CKDYF 103Z 50	
C7	Ceramic	100p	50V	CCDSL 101K 50	
C8	Ceramic	18p	50V	CCDSH 180K 50	
C9	Ceramic	8p	50V	CCDCH 080F 50	
C10	Ceramic	33p	50V	CCDCH 330K 50	
C11	Ceramic	1 5p	50V	CCDCH 150K 50	
C12	Ceramic	0.01	50 V	CKDYB 103K 50	
	Ceramic Ceramic				
C13		0.01	50V	CKDYF 103Z 50	
C14	Ceramic	0.047	25V	CKDBC 473Z 25	
C15	Ceramic	22 0 p	50V	CCDSL 221K 50	
C16	Ceramic	0.047	25V	CKDBC 473Z 25	
C17	Electrolytic	4.7	25V	CEA 4R7P 25	
C18	Ceramic	100p	50V	CCDSL 101K 50	
C19	Electrolytic	10	16V	CEA 100P 16	
C20	Electrolytic	0.47	50V	CEA R47P 50	
224		0.047	ÓE) (04550 4707 05	
C21	Ceramic	0.047	25V	CKDBC 473Z 25	
C22	Ceramic	0.01	50V	CKDYF 103Z 50	
C23	Ceramic	0.01	50V	CKDYF 103Z 50	
C24	Electrolytic	1	50V	CEA 010P 50	
C25	Electrolytic	100	16V	CEA 101P 16	
C26	Ceramic	8p	50V	CCDXL 080F 50	
C27	Styrol	330p	50V	CQSA 331J 50	
C28	Mylar	0.01	50V	CQMA 103K 50	
C29	Ceramic	0.04	50V	CKDYF 403Z 50	
C30	Ceramic	0.01	50V	CKDYF 103Z 50	
004		0.04	E0) /	OKDVE 4007 50	
C31	Ceramic	0.01	50V	CKDYF 103Z 50	
C32	Electrolytic	10	16V	CEA 100P 16	
C33	Ceramic	0.04	50V	CKDYF 403Z 50	
C34	Electrolytic	4.7	25V	CEA 4R7P 25	
C35	Electrolytic	47	6V	CEA 470P 6	
C36	Ceramic	22 0 p	50V	CCDSL 221K 50	
C37	Electrolytic	100	16V	CEA 101P 16	
C38	Electrolytic	0.1	25V	CSSA OR1M 25	
C39	Ceramic	0.01	50V	CKDYB 103K 50	·
C40	Ceramic	0.01	50V	CKDYB 103K 50	· -
		0.0			
C41	Mylar	0.047	50V	CQMA 473K 50	
C42	Styrol	510p	50V	CQSH 511J 50	
C43	Electrolytic	0.33	10V	CSSA R33M 10	
C44	Electrolytic	1	10V	CSSA 010M 10	
C44 C45	Electrolytic	0.47	10V	CSSA R47M 10	

Symbol	De	escription		Part No.	
C46	Mylar	0.0091	50V	CQMA 912J 50	
C47	Mylar	0.0091	50V	CQMA 912J 50	
C48	Ceramic	0.0022	50V	CKDYB 222K 50	
C49	Ceramic	0.0022	50V	CKDYB 222K 50	
C50	Ceramic	560p	50V	CKDYB 561K 50	
C51	Ceramic	560p	50V	CKDYB 561K 50	
C52	Ceramic	0.0018	50V	CKDYB 182K 50	
C53	Ceramic	0.0018	50V	CKDYB 182K 50	
C54	Electrolytic	0.47	25V	CSSA R47M 25	
C55	Electrolytic	0.47	25V	CSSA R47M 25	
C56	Ceramic	100p	50V	CCDSL 101K 50	
C57	Ceramic	0.75p	500V	CGB R75K 500	
C58	Electrolytic	10	16V	CEA 100P 16	
C59	Ceramic	100P	50V	CCDSL 101K 50	
C60	Ceramic	100 p	50V	CCDSL 101K 50	
C61	Ceramic	0.04	50V	CKDYF 403Z 50	
C62	Ceramic	0.04	50V	CKDYF 403Z 50	
C63	Ceramic	0.04	50V	CKDYF 403Z 50	
C64					

RESISTORS

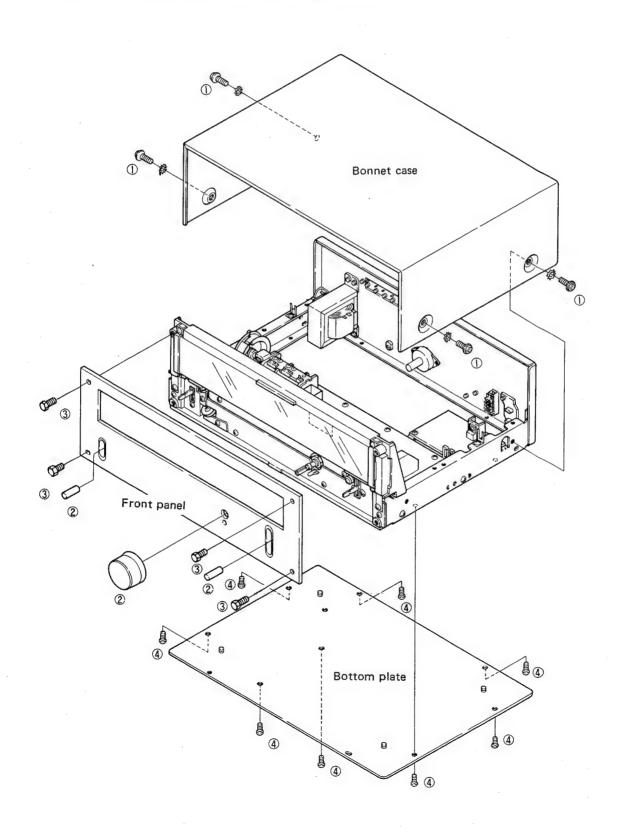
Symbol	De	scription	Part No.	
R 1	Carbon film	100	RD%PS 101J	
R2	Carbon film	1k	RD%PS 102J	
R3	Carbon film	150	RD¼PS 151J	
R4	Carbon film	18k	RD¼VS 183J	
R5	Carbon film	3.3k	RD%PS 332J	
R6	Carbon film	100	RD%PS 101J	
R7	Carbon film	6.8k	RD%VS 682J	
R8	Carbon film	12k	RD%VS 123J	
R9	Carbon film	2.2k	RD¼VS 222J	
R10	Carbon film	330	RD%PS 331J	
R11	Carbon film	560k	RD%PS 564J	
R12	Carbon film	12k	RD%PS 123J	
R13	Carbon film	16k	RD1/4PS 163J	
R14	Carbon film	330	RD%PS 331J	
R15	Carbon film	10k	RD%PS 103J	
R16	Carbon film	2.4k	RD1/4PS 242J	
R17	Carbon film	22	RD%PS 220J	
R18	Carbon film	2.2k	RD%PS 222J	
R19	Carbon film	47k	RD1/4PS 473J	
R20	Carbon film	5.1k	RD%PS 512J	
R21	Carbon film	3.3k	RD%PS 332J	ļ.
R22	Carbon film	39k	RD%PS 393J	
R23	Carbon film	47	RD4PS 470J	
R24	Carbon film	100	RD4PS 101J	
R25	Carbon film	24k	RD%PS 243J	

4. BLOCK DIAGRAM



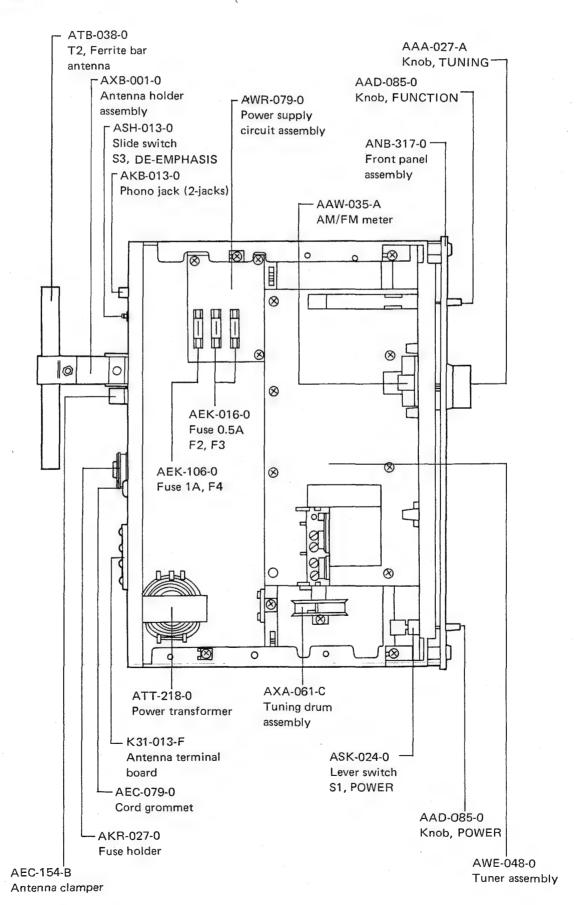
5. DISASSEMBLY

- 1. To remove the bonnet case, remove 2 screws each fastening either side and lift the bonnet case.
- 2. Pull off all the knobs.
- 3. To remove the front panel, remove 4 screws.
- 4. To remove the bottom plate, remove a total of 8 screws.



6. PARTS LOCATION

Top View



7. ADJUSTMENTS

FM Section

1.	Switch positions on the TX-5300:
	FUNCTION FM MONO
	POWER ON

2. Connection of instruments: FM Signal Generator (FM S

FM Signal Generator (FM SG)... Connect to FM ANTENNA terminals through 300Ω dummy antennà.

AC Voltmeter
Distortion meter
Oscilloscope

Connect in parallel to OUTPUT jack.

 Set FM SG to 100% modulation (±75kHz deviation) at 400Hz and 100dB output.

4. Tune FM SG and TX-5300 to dial readings of 87.4MHz (left scale end).

5. Adjust T5 (lower core) so that AM/FM meter points to the center.

6. Set FM SG output to 8 ~ 10dB and adjust T1, T2 and T3 to maximize audio frequency output level.

7. Tune FM SG and TX-5300 to dial readings of 106MHz.

8. Set FM SG output to 8 \sim 10dB and adjust TC1, TC2 and TC3 to maximize audio frequency output level.

Repeat steps 4 through 8 so that output is maximized when the dial

indicates the given frequencies.

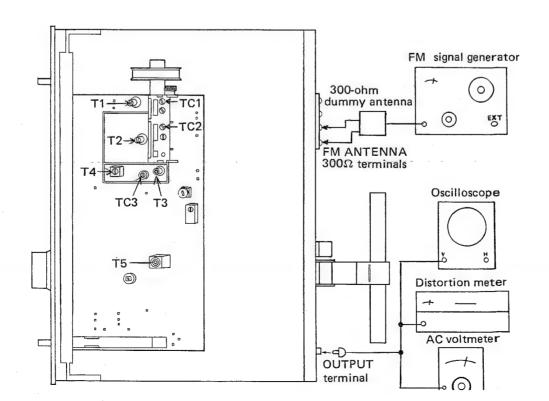
9. Tune FM SG and TX-5300 to dial readings of 87.4MHz and adjust T4 to maximize audio frequency output level when FM SG output is $8 \sim 10 dB$.

10. Detune TX-5300 so that only noise is received.

11. Adjust T5 (lower core) so that AM/FM meter points to the center.

12. Tune FM SG and TX-5300 to dial readings of 98MHz. Fine tune TX-5300, observing AM/FM meter.

13. Set FM SG output to 60dB and adjust T5 (upper core) to minimize distortion.



FM MPX Section

- The TX-5300 incorporates a PLL demodulator circuit. This adjustment should only be made when MPX IC has been replaced.
- This adjustment should be made after completion of FM section adjustment.
- 1. Switch positions on the TX-5300:
 FUNCTION FM AUTO
 POWER ON
- 2. Connection of instruments:

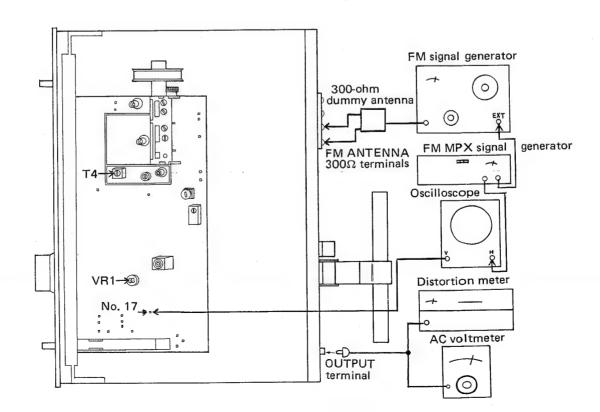
FM Signal Generator (FM SG) . . . Connect to FM ANTENNA terminals through 300Ω dummy antenna.

MPX Signal Generator (MPX SG) . Connect to FM SG's external modulator terminals.

Distortion meter Connect to OUTPUT jack.

3. Tune FM SG and TX-5300 to dial readings of 98MHz.

- 4. Set MPX SG to ±67.5kHz deviation at 1kHz for left and right channels and FM SG output to 60dB.
- 5. Produce a Lissajous pattern on oscilloscope and adjust VR1 to make the pattern still.
- 6. Set MPX SG to ±67.5kHz deviation at 1kHz for left and right channels and to ±7.5kHz deviation for 19kHz pilot signal. Set FM SG output to 60dB.
- 7. Adjust T4 to minimize distortion of audio frequencies for left or right channel.



AM Section

1.	Switch positions on the TX-5300:	
	FUNCTION	AM
	POWER	NC

2. Connection of instruments:

AM Signal Generator (AM SG) . . . Connect to AM ANTENNA terminals in series with dummy antenna ($1k\Omega$ resistor).

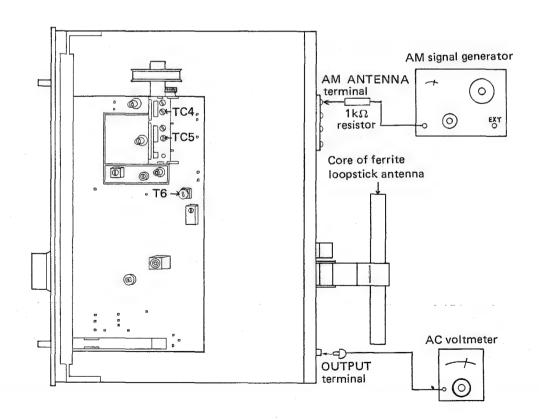
AC Voltmeter Connect to OUTPUT jack.

3. Set AM SG to 30% modulation at 400Hz and 30dB output.

4. Tune AM SG and TX-5300 to dial readings of 600kHz and adjust T6 to maximize audio frequency output level. (Adjust core of ferrite loopstick antenna at the same time.)

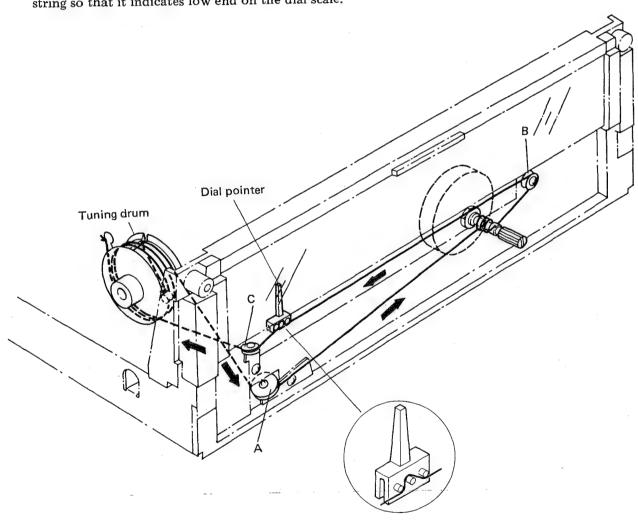
5. Tune AM SG and TX-5300 to dial readings of 1,400kHz and adjust TC4 and TC5 to maximize audio frequency output level.

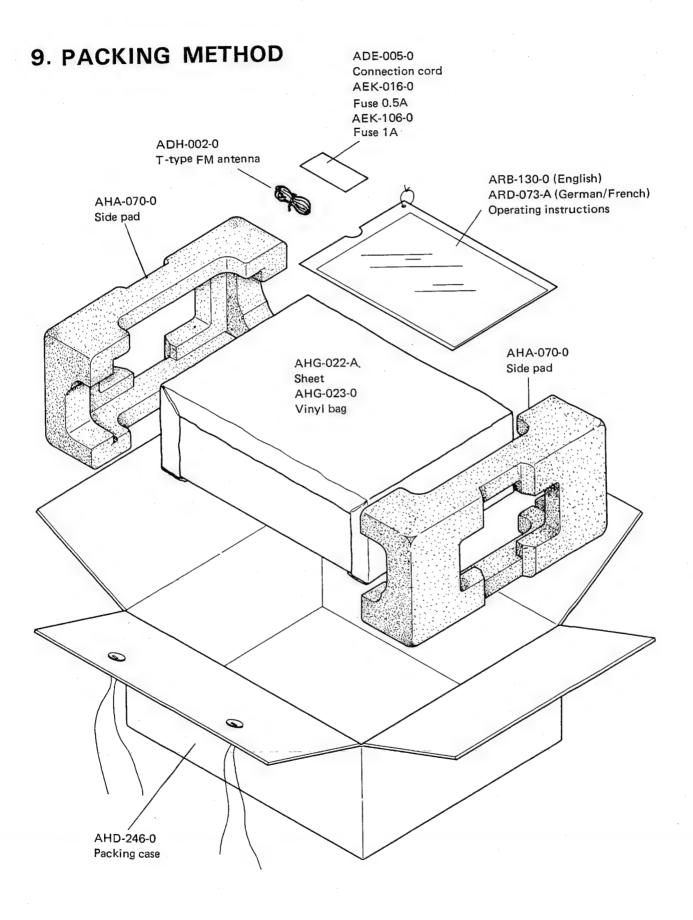
 Repeat steps 4 and 5 so that output is maximized when the dial indicates these frequencies.



8. DIAL CORD STRINGING

- 1. Set the tuning capacitor to maximum capacitance, fully counterclockwise.
- 2. Fasten one end of the cord to the protrusion on the tuning drum and lead it round pulley A.
- 3. Wind the cord 3 turns round the tuning shaft and run it round pulleys B and C.
- 4. Wind the cord 2 turns round the dial pulley and tie the end to the spring while tensioning the spring slightly.
- 5. Confirm that dial stringing moves smoothly. If so, cut the unnecessary portion of string.
- 6. Turn the tuning knob fully counterclockwise and fix the dial pointer to string so that it indicates low end on the dial scale.





10. EXPLODED VIEW AND PARTS LIST

NOTE:

Parts number is subject to change for the purpose of improvement with notice of a service bulletin.

Service bulletin will be furnished whenever necessary and you are requested to amend parts number in this manual according to the instructions.

Parts List of Exploded View

NOTICE: Any parts asterisked (*) are subject to being not supplied.

Key No.	Description	Part No.	
1	Tuning drum assembly	AXA-061-C	
2	Tuner assembly	AWE-048-0	
3*	Dial scale plate holder	AEB-066-A	
4*	Rubber clamper	ANF-273-0	
5	Dial scale	AAG-090-0	
6	Lamp holder	AKK-002-0	
7	Lamp 8V, 300mA, dial scale (PL3~4)	E22-032-0	bar type
8*	Insulator (L)	AEC-170-B	
9	Front panel	ANB-317-0	Including 35, 36
10		•••••	
11	Screw, front panel	ABA-021-A	
12	Knob (FUNCTION, POWER)	AAD-085-0	
13	Knob (TUNING)	AAA-027-A	
14	Power transformer (T1)	ATT-218-0	
15	Terminal strip 2P	AKC-030-0	
16	Wire clip (B)	AEC-005-0	
17*	Side frame	ANF-270-C	
18	Lever switch (S1, POWER)	ASK-024-0	
19	Lamp 8V, 50mA (PL2, meter)	AEL-026-0	with leads
20	Rubber tube	AEB-065-0	
21	AM/FM meter	AAW-035-A	
22	Tuning shaft assembly	AXA-066-0	
23*	Center frame	ANF-272-A	
24*	Front frame	ANF-271-A	
25	Lamp 6V, 30mA (PL1, stereo ind.)	AEL-017-A	
26	Flat washer	B 22-012-0	
27*	Panel stay	AEC-163-B	
28	Pulley shaft	M49-025-E	
29	Pulley (small)	AEC-017-0	
30	Pulley-held metal	ANG-109-0	
31	Pulley (large)	AEC-101-0	
32	Pulley-held metal	ANG-110-0	
33	Dial pointer guide plate	AND-078-0	
34	Dial pointer	AAF-032-0	
35	Spacer	AEC-166-0	attached 9
36	Spacer	AEC-168-0	attached 9
37	Insulator (R)	AEC-173-B	
38	Bonnet	ANE-082-0	
39		ABA-079-A	
- 1	Screw, bonnet, M4x8		
40	Claw washer	B21-011-0	

NOTICE: Any parts asterisked (*) are subject to being not supplied.

Key No.	Description	Part No.	
41	Antenna terminal board	K31-013-F	
42*	Rear panel	ANC-156-0	
43	Cord grommet	AEC-079-0	
44	AC power cord	ADG-004-0	
45	Antena clamper	AEC-154-B	
46	Power supply circuit assembly	AWR-079-0	
47*	Ground terminal strip (2P)	K13-048-0	
48	Phono jack (2-jacks)	AKB-013-0	
49*	Bottom plate	ANE-061-0	
50	Foot	AEC-083-A	
51	Antenna holder assembly	AXB-001-0	
52	Ferrite bar antenna (T2)	ATB-038-0	
53	Slide switch (S3, DE-EMPHASIS)	ASH-013-0	
54	Lock plate	AEC-199-0	
55	Fuse holder (line voltage selector)	AKR-027-0	
56			
57	Pulley shaft	ALA-017-0	
58	Washer (t = 1 mm)	M45-086-0	
59	Nut (9 ϕ)	B71-004-0	

Symbol	Des	scription	Part No.	
R26	Carbon film	2.2k	RD%PS 222J	
R27	Carbon film	2k	RD%PS 202J	
R28	Carbon film	3.3k	RD%PS 332J	
R29	Carbon film	270	RD%PS 271J	
R30	Carbon film	2.7k	RD%PS 272J	
R31	Carbon film	2.7k	RD%PS 272J	
R32	Carbon film	15k	RD%PS 153J	
R33	Carbon film	3.3k	RD%PS 332J	
R34	Carbon film	8.2k	RD%PS 822J	
R35	Carbon film	8.2k	RD¼PS 822J	
R36	Carbon film	10k	RD%PS 103J	
R37	Carbon film	10k	RD1/4PS 103J	
R38	Carbon film	3.9k	RD1/4PS 392J	
R39	Carbon film	3.9k	RD4PS 392J	
R40	Carbon film	24k	RD%PS 243J	
R41	Carbon film	680	RD%PS 681J	
R42	Carbon film	680	RD%PS 681J	
R43	Carbon film	100k	RD%PS 104J	
R44	Carbon film	100k	RD%PS 104J	
R45	Carbon film	150	RD%PS 151J	
R46	Carbon film	240	RD%PS 241J	
R47	Carbon film	3.3k	RD¼VS 332J	
R48	Carbon film	8.2k	RD%V\$ 822J	·
VR1	Semi-fixed	4.7k-B	C92-051-0	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	FET	3SK30-B (2SK55-D)	· · · · · · · · · · · · · · · · · · ·	
Q2	Transistor	2SC535-A or B		
Q 3	Transistor	2SC461-B		
Q4	IC	HA1137		
Ω5	IC	HA1138		
Ω6	IC	HA1156		
Q7	Transistor	2SA763P-6 or 5 (2SA725-F or G)		
Ω8	Transistor	2SA763P-6 or 5 (2SA725-F or G)	_	
D1	Diode	1S 2076 (1S 2473)		
D2	Diode	1S 2076 (1S 2473)		·
D3	Diode	1S 2076 (1S 2473)		

TRANSFORMERS, COILS

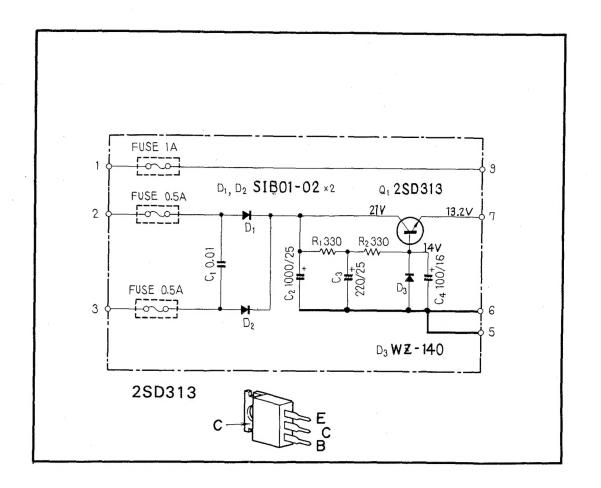
Symbol	Description	Part No.	
T1	FM antenna coil	ATC-030-0	
T2	FM RF coil	ATC-024-0	
Т3	FM oscillator coil	ATC-031-0	
T4	FM matching transformer	ATE-008-A	
T5	FM IF transformer	T73-035-A	

Symbol	Description	Part No.	
Т6	AM oscillator coil	ATB-039-0	
F1 F2	FM ceramic filter FM ceramic filter	ATF-013-B ATF-013-B ATF-027-0	
F3	AM ceramic filter	T24-028-A	
L1	RF choke coil 2.2μH	1	
L2	RF choke coil 2.2µH	T24-028-A	
L3	RF choke coil 18μΗ	ATH-007-0	
L4	RF choke coil 2.2µH	T24-028-A	
L5	RF choke coil 100μH	T24-030-A	

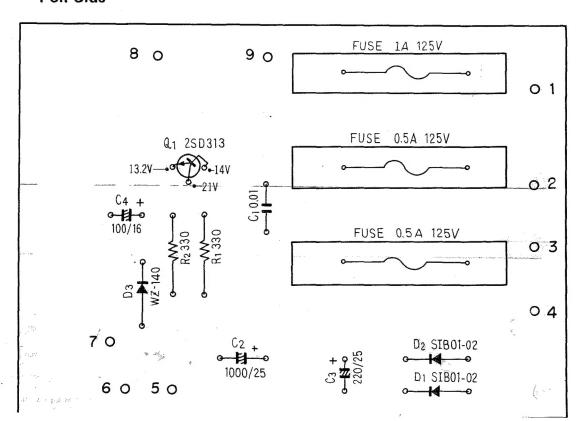
OTHERS

Symbol	Description	Part No.	
	Shield plate Lever switch (FUNCTION)	ANH-114-0 ASK-082-0	

11.4 POWER SUPPLY CIRCUIT ASSEMBLY (AWR-079-0)



Foil Side



Parts List of Power Supply Circuit Assembly (AWR-079-0)

CAPACITORS

Symbol	De	escription		Part No.	
C1	Ceramic	0.01	150V	ACG-002-0	
C2	Electrolytic	1000	25V	CEA 102P 25	
C3	Electrolytic	220	25V	CEA 221P 25	
C4	Electrolytic	100	16V	CEA 101P 16	

RESISTORS

Symbol	Description	Part No.	
R1	Carbon film 330	RD%PS 331J	
R2	Carbon film 330	RD%PS 331J	

SEMICONDUCTORS

Symbol	Description		Part No.	
D1 D2 D3	Diode Diode Zener diode	SIB01-02 SIB01-02 WZ-140		
Q1	Transistor	2SD313-E		

OTHERS

Symbol	Description	Part No.	
S1	Heat sink Fuse clip	ANH-117-0 AKR-013-0	

4-1, 1-Chome, Meguro, Meguro-ku, Tokyo 153, Japan

U.S. PIONEER ELECTRONICS CORPORATION

75 Oxford Drive, Moonachie, New Jersey 07074,U.S.A.

PIONEER ELECTRONIC (EUROPE) N.V.

Meir-Center Meir 21, 2000 Antwerp, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY. LTD.

256-8 City Road, South Melbourne, Victoria 3205, Australia